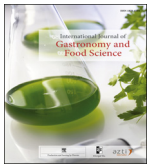

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Culinary concept

Generating, entrapping and transferring natural aromas to the dish and selected environments

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Abstract

There are many aromas in nature that could be related to different memories and sensations once we perceive them. By using non-aggressive techniques it is possible to extract aromas in a natural way in order to hold, enhance and transfer them to the dish. This work shows how aromas can be retained into a holder device according to their polarity, without physical or chemical alteration, and how they can be transferred to the final dish and to guest surrounding atmosphere/environment.

Keywords: Aromatization; Naturan; Olfactory sensations; Flavoured dishes; Environments recreating nature

Introduction to the culinary concept

May a world be re-created in a dish?

Taking this premise or reflection as a starting point, the vision from Azurmendi's restaurant is to create an extraordinary experience, which will be able, from the restaurant's comfort, to build self-defining experiences of cultural transmission and thereby, to display our perceptions and intentions. That experience we intend to construct would be comparable to reading a novel divided by several chapters. Those chapters would be represented in each dish, each bite…in order to make the guest *travel*, in an allegoric manner, and meet our products-by means of each dish, our places, our culture, our gastronomic heritage, *our world*. To do this, we thought that we should set the guest on a proper context, where everything was *pleasurable* and *understandable*. For this reason, we decided that each dish was, to a large extent, self-sufficient, able to tell a whole story by itself. Each dish, each ingredient can tell its own story only when they are settled in their own habitat, their own space, *their world*. We thought that each *chapter* should be *garnished* with its own essence, with its soul, with something we all have and it may help for a better understanding of each dish: *a proper and natural aroma. We thought about stealing the soul of the nature in order to re-create it in a dish*.

Contrary to evolution that has better developed the sense of sight, taste and touch, the sense of smell has been pushed into the background (Sela and Sobel, 2010). This sense has not been stimulated in the same way than the mentioned senses, although recent considerations within the field of culinary research emphasize that the full combination of senses shows an important gastronomic potential (Auvray and Spence, 2008). Therefore, guests can experience a more grateful interaction with the dish by fully considering these four senses together when tasting a dish (White, 1996).

The aim of this work is to create an aroma which can be identified with a specific memory, instant or place. This idea starts from the very moment that we yearn guests to fully feel a dish with all their senses. By means of that aroma, it will be able to evoke such memory, instant or place (Swiegers et al., 2005; Astray et al., 2007). This is the reason for which it was necessary to develop a new procedure or device to extract and hold aromas. This device can provide a specific aroma to the

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food as well as to the environment with the purpose of stimulating the guests.

Culinary concept: definition

The generation, entrapment and controlled desorption of aromas and odors can be added either to a certain kind of food or to the environment which surrounds a collection of food. We have built a portable, versatile and easy-to-use home-made prototype (Naturan) in order to evoke a particular memory, moment or place to the guest.

Description of the culinary process:

Prototype description

This home-made portable device (Trebolazabala et al., 2011a, 2011b) includes different parts or units (Fig. 1). A pump generates an air flow which is driven by a tube throughout several vessels containing a selection of products (they can be in solid, liquid or gas state) which pervade the air flow with their particular aromas. As the air flow passes through the product, it causes a release effect of the molecules which characterize the aroma of that product. By this means, it is possible to fill the pumped air with a second aroma or with many aromas if it is desired. At the end of the circuit, this flavored flow is entrapped and stored in a compartment with an adsorbent solid. From this point, there are two possibilities, (1) to add the adsorbent solid with the entrapped aroma directly to a dish or, (2) to release the aroma contained in the solid adsorbent into a chosen place. In the latter case, the aroma or aromas hold in the adsorbent solid can be liberated after thermal desorption by using infrared light and without contacting food.

Therefore, the adsorbent product can be easily carried from one place to another without losing their aromatic properties.

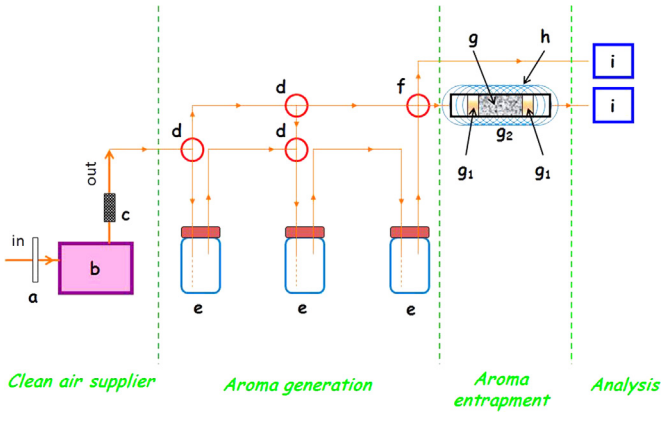

Fig. 1. Schematic diagram of the prototype for the generation, entrapment and controlled desorption of aromas and odors. (a) Air filter; (b) pump; (c) carbotrap; (d) three-way valve; (e) closed containers; (f) four-way valve; (g) adsorption/desorption trap; (g_1) cotton wool; (g_2) solid adsorbent; (h) electric or IR heater; and (i) port for organoleptic analysis.
Diagram made by Alberto de Diego.

By using this procedure, it is possible to aromatize a dish on the table, in front of the guest or in the kitchen with no need to change the device's location.

Case studies

The described procedure covers a short number of stages, as well as obtaining a broad range of different aromas depending on the material enclosed in each vessel. This permits that the aroma travels from one container to another. We must remember that most of the molecules, containing aroma properties, are partially polar, that means water environments (moist air, aqueous liquids or ionic solids) can be used to trap (absorb) those molecules using procedures with few steps.

For instance, the re-creation of the aroma related to the smell coming up from the soil, in a forest, when it starts raining after a warm day, was obtained in a simple way. Three containers were used, the first containing water, the second containing a selection of small stones from the forest, with all of its natural biota attached, and the third holding a natural soil taken in the forest; an air stream is pumped to the first container just to dampen it, then it passes through the stones to extract the so-called *Petricor* aroma and finally the wet air flow, with the natural molecules from the stones, is conducted to the third container to extract the *Geosmine* molecules (natural compounds produced by the *Streptomyces coelicolor* and some other bacteria). This obtained flavor, which is simply trapped in water at the end of the process, is chemically formed by quite different organic molecules of natural origin, including some coming from the decomposition of fulvic and humic acids, and cannot be reproduced artificially in the laboratory. By using this simple method and following the above mentioned stages, it is possible to obtain a very individual flavor (Fig. 2).

Likewise, for certain foods or environments, it is possible to combine a broad variety of materials to get the following examples:

- Truffle in their own environment: flavor of the oak leaves, acorns and the soil whence this fungus is harvested.
- Figs in their own environment: fig leaves aroma
- Young pigeon in the cherry's land: flavor of soil and cherry (Fig. 3).
- Oyster on sea's aroma: sea's flavor generated by a mixture of seaweed, barnacles and sea water (Fig. 4).
- Garden: aroma of vegetable garden created from cucumber, beetroot and soil flavors.

With similar methodologies, we could carry out other applications using a choice of aromatic substrates, liquids (fruits extracts and juices, vegetable squeeze, wines, etc.) and solids (aromatic herbs, coffee, woods, etc.). The diversity of aromas and likely combinations increase due to the fact that it is possible to use it for different purposes in the restaurant. For example, if the idea is to aromatize the surroundings of the table, you can use supports that are not edible, like the

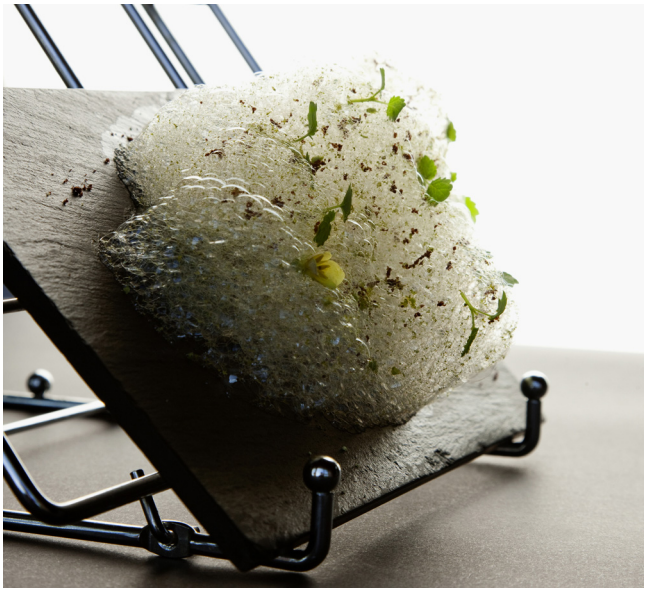

Fig. 2. Presentation of the dish *moss*. The aroma so-called *petricor* has been added and it is related to the flavor released by the soil when it starts to rain after a very warm day.
Photograph from Azurmendi.

Fig. 4. Oyster on sea's aroma: sea's flavor generated by a mixture of seaweed, barnacles and sea water.
Photograph from Azurmendi.

Fig. 3. Young pigeon in the cherry's land: flavor of soil and cherry.
Photograph from Azurmendi.

commercially available carbotrap, tenax, etc. that absorb the aroma in the machine and desorbs it by simple heating. But if you wish to include the aroma in the dish, you can trap it in a fluid (like water, oil, milk, Champaign, wines, etc.) and/or solid edible materials (like salt, sugar, starch, tapioca, etc.).

Some studies (Orth and Bourrain, 2008; Larsson and Willander, 2009) demonstrate that aromas could have the power of generating feelings and memories from the childhood. The guests who receive the delivery of these aromas can associate perceptions and relate them to their own memories while emotions and feelings come out. Therefore, an aroma can provide a dish with different feelings like happiness, warmth or even sadness regarding to the consumer experiences in life with this aroma which can completely change the perception of a dish. In conclusion, according to this culinary concept, this method of generating and entrapping odors represents an important innovation to cleverly drive those aromas to a dish or to a desired site where the food is served. It highly stimulates guest´s smell and gives a high quality value to the cooked dish.

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